CERTIFICATE

Certified Passive House Component

Component-ID 2463ws04 valid until 31st December 2025
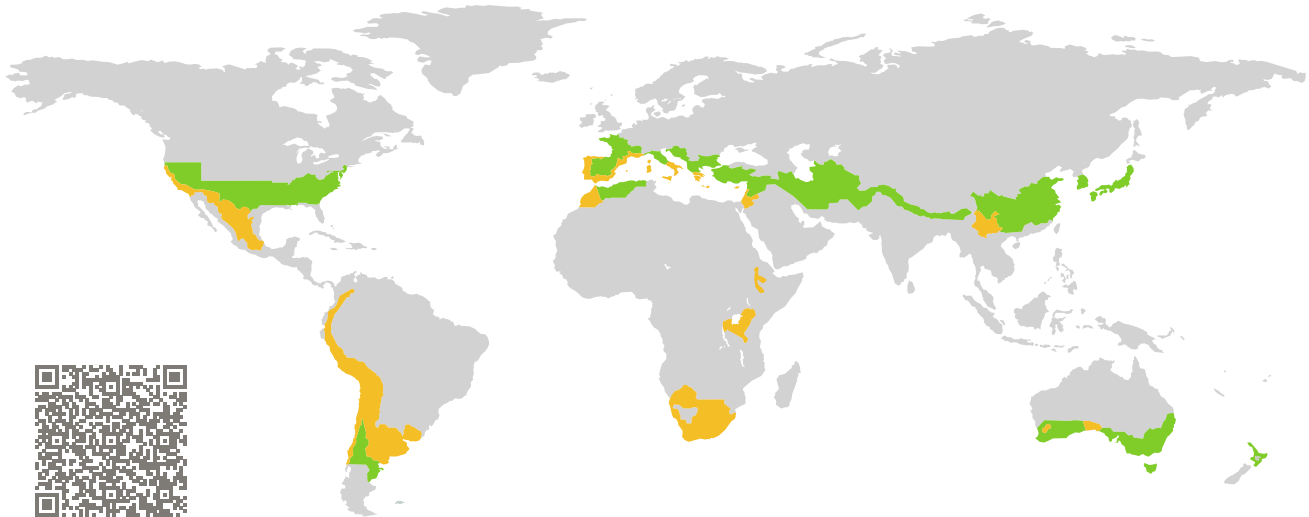
Category:	**Window system**
Manufacturer:	**GEALAN Fenster Systeme GmbH, Santa Pola-Alicante, Spain**
Product name:	**System LINEAR**

This certificate was awarded based on the following criteria for the warm, temperate climate zone

Comfort
$$U_W = 1.00 \quad \leq \quad 1.00\ \text{W/(m}^2\,\text{K)}$$
$$U_{W,\text{installed}} \quad \leq \quad 1.05\ \text{W/(m}^2\,\text{K)}$$
$$\text{with}\ U_g \quad = \quad 0.90\ \text{W/(m}^2\,\text{K)}$$

Hygiene
$$f_{Rsi=0.25} \quad \geq \quad 0.65$$

Airtightness
$$Q_{100} = 0.09 \quad \leq \quad 0.25\ \text{m}^3/(\text{h}\,\text{m})$$

warm, temperate climate

ph**B**

CERTIFIED COMPONENT

Passive House Institute

Passive House efficiency class	ph**E**	ph**D**	ph**C**	ph**B**	ph**A**

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Calculation model	Isothermal
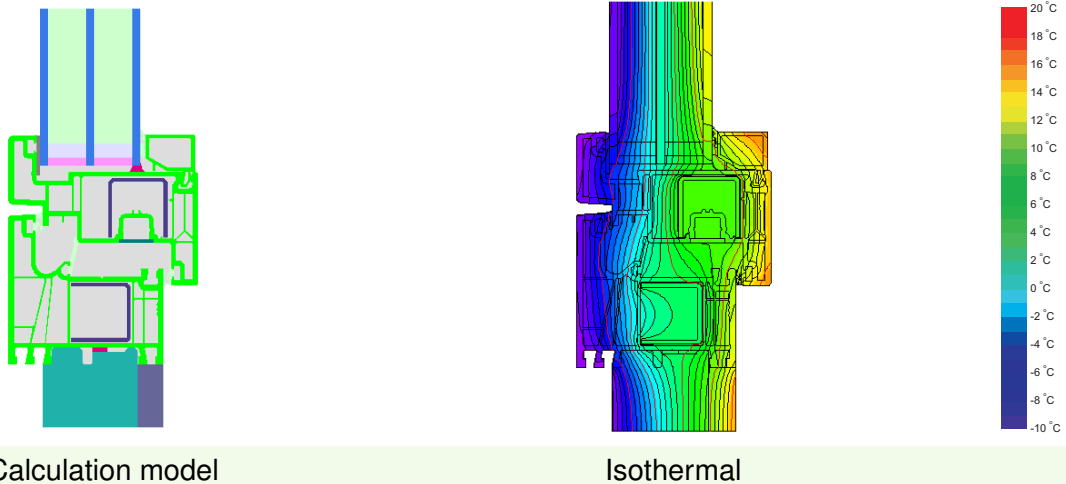
Description

Window system with steel reinforcements and insulated sill profile. Maximum 30 kg/m² glass weight: white and colored sash 7072 STV 7730 0.90 * 2.1 m. Airtightness UNE-EN 1026:2017 value of 0.29 m³/m² (Class 4) @100 Pa Pane thickness: 48 mm (4/18/4/18/4), rebate depth: 15 mm. 7077 leaf with STV, interior glass sealing and reinforcement 8727, 7001 frame with reinforcement 8727, 7060 casement with reinforcement 7731, 7040 crossbar with reinforcement 7731, 2595 sill with 7441 rain gutter, 7448 mats and 8178 rubber.

Explanation

The window U-values were calculated for the test window size of $2.46\,\text{m} \times 1.48\,\text{m}$ with $U_g = 0.90\,\text{W/(m}^2\,\text{K)}$. If a higher quality glazing is used, the window U-values will improve as follows:

Glazing	$U_g =$	0.90	0.80	0.70	0.55	W/(m² K)
		↓	↓	↓	↓	
Window	$U_W =$	1.00	0.93	0.86	0.76	W/(m² K)

Transparent building components are classified into efficiency classes depending on the heat losses through the opaque part. The frame U-Values, frame widths, thermal bridges at the glazing edge, and the glazing edge lengths are included in these heat losses. A more detailed report of the calculations performed in the context of certification is available from the manufacturer.

The Passive House Institute has defined international component criteria for seven climate zones. In principle, components which have been certified for climate zones with higher requirements may also be used in climates with less stringent requirements. In a particular climate zone it may make sense to use a component of a higher thermal quality which has been certified for a climate zone with more stringent requirements.
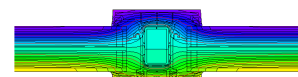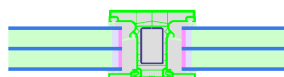
Further information relating to certification
can be found on www.passivehouse.com and passipedia.org.

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Frame values			Frame width b_f mm	U-value frame U_f W/(m² K)	Ψ-glazing edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Mullion fixed	(0M1)		94	1.21	0.026	0.69
Transom fixed	(0T1)		94	1.21	0.026	0.69
Mullion 1 casement	(1M1)		152	1.18	0.023	0.67
Transom 1 casement	(1T1)		152	1.18	0.023	0.67
Mullion 2 casements	(2M1)		170	1.13	0.023	0.70
Transom 2 casements	(2T1)		170	1.13	0.023	0.70
Bottom fixed	(FB1)		102	0.99	0.026	0.70
Top fixed	(FH1)		72	1.08	0.026	0.79
Lateral fixed	(FJ1)		72	1.08	0.026	0.79
Flying Mullion	(FM1)		132	1.15	0.024	0.69
Bottom	(OB1)		140	1.01	0.023	0.70
Head	(OH1)		110	1.07	0.023	0.70
Jamb	(OJ1)		110	1.07	0.023	0.70
Threshold	(OT1)		82	1.74	0.024	0.61
Spacer: MULTITECH G				Secondary seal: Polysulfide		

Mullion
fixed

b_f = 94 mm

U_f = 1.21 W/(m² K)

Ψ_g = 0.026 W/(m K)

f_{Rsi} = 0.69

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Transom
fixed

$b_f = 94$ mm

$U_f = 1.21$ W/(m^2 K)

$\Psi_g = 0.026$ W/(m K)

$f_{Rsi} = 0.69$
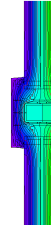
Mullion
1 casement

$b_f = 152$ mm

$U_f = 1.18$ W/(m^2 K)
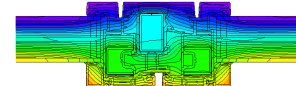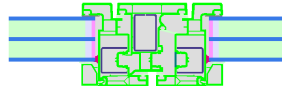
$\Psi_g = 0.023$ W/(m K)

$f_{Rsi} = 0.67$

Transom
1 casement

$b_f = 152$ mm

$U_f = 1.18$ W/(m^2 K)

$\Psi_g = 0.023$ W/(m K)

$f_{Rsi} = 0.67$
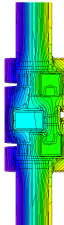
Mullion
2 casements

$b_f = 170$ mm

$U_f = 1.13$ W/(m^2 K)
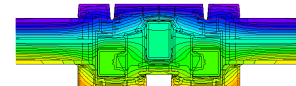
$\Psi_g = 0.023$ W/(m K)

$f_{Rsi} = 0.70$

Transom
2 casements

$b_f = 170$ mm

$U_f = 1.13$ W/(m^2 K)

$\Psi_g = 0.023$ W/(m K)

$f_{Rsi} = 0.70$

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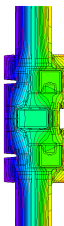
Bottom
fixed

$b_f = 102\,mm$

$U_f = 0.99\,W/(m^2\,K)$

$\Psi_g = 0.026\,W/(m\,K)$

$f_{Rsi} = 0.70$
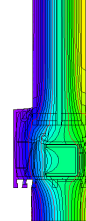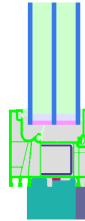
Top
fixed

$b_f = 72\,mm$

$U_f = 1.08\,W/(m^2\,K)$
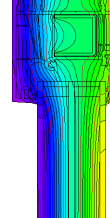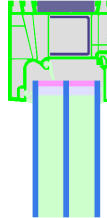
$\Psi_g = 0.026\,W/(m\,K)$

$f_{Rsi} = 0.79$

Lateral
fixed

$b_f = 72\,mm$

$U_f = 1.08\,W/(m^2\,K)$

$\Psi_g = 0.026\,W/(m\,K)$
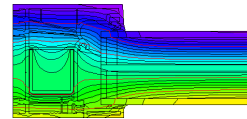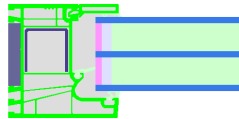
$f_{Rsi} = 0.79$

Flying Mullion

$b_f = 132\,mm$

$U_f = 1.15\,W/(m^2\,K)$

$\Psi_g = 0.024\,W/(m\,K)$

$f_{Rsi} = 0.69$
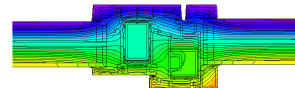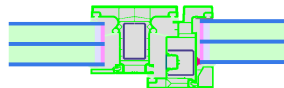
Bottom

$b_f = 140\,mm$

$U_f = 1.01\,W/(m^2\,K)$

$\Psi_g = 0.023\,W/(m\,K)$

$f_{Rsi} = 0.70$

System LINEAR

Head

$b_f = 110\,\text{mm}$
$U_f = 1.07\,\text{W/(m}^2\,\text{K)}$
$\Psi_g = 0.023\,\text{W/(m K)}$
$f_{Rsi} = 0.70$

Jamb

$b_f = 110\,\text{mm}$
$U_f = 1.07\,\text{W/(m}^2\,\text{K)}$
$\Psi_g = 0.023\,\text{W/(m K)}$
$f_{Rsi} = 0.70$

Threshold

$b_f = 82\,\text{mm}$
$U_f = 1.74\,\text{W/(m}^2\,\text{K)}$
$\Psi_g = 0.024\,\text{W/(m K)}$
$f_{Rsi} = 0.61$

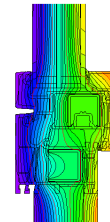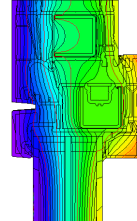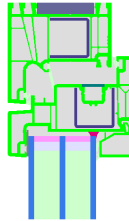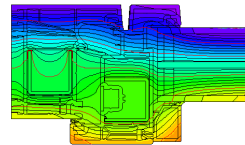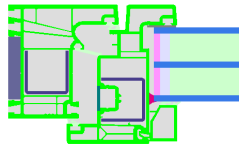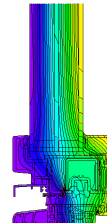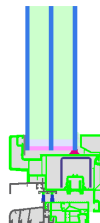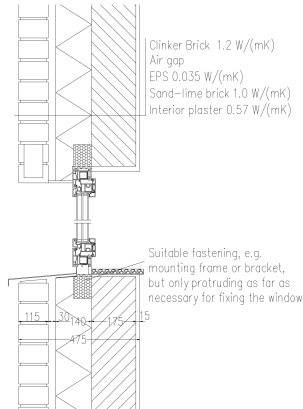**www.passivehouse.com**

Validated installations

Cavity wall (operable)

$U_{\text{Wall}} = 0.22\ \text{W/(m}^2\text{K)}$

Clinker Brick 1.2 W/(mK)
Air gap
EPS 0.035 W/(mK)
Sand−lime brick 1.0 W/(mK)
Interior plaster 0.57 W/(mK)

Suitable fastening, e.g. mounting frame or bracket, but only protruding as far as necessary for fixing the window

Ψ_{install}	W/(m K)
Top	−0.006
Left	−0.006
Right	−0.006
Bottom	0.023

$U_{W,\text{installed}} = 1.01\ \text{W/(m}^2\text{K)}$

Exterior insulation and finishing system (EIFS) (fixed glazed)

$U_{\text{Wall}} = 0.23\ \text{W/(m}^2\text{K)}$

Exterior plaster 1.0 W/(mK)
EPS 0.035 W/(mK)
Adhesive 0.70 W/(mK)
Sand−lime brick 1.0 W/(mK)
Interior plaster 0.57 W/(mK)

Suitable fastening, e.g. mounting frame or bracket, but only protruding as far as necessary for fixing the window
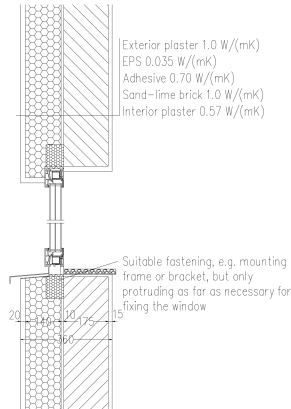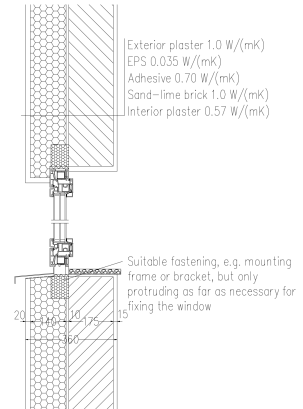
Ψ_{install}	W/(m K)
Top	−0.004
Left	−0.004
Right	−0.004
Bottom	0.022

$U_{W,\text{installed}} = 1.01\ \text{W/(m}^2\text{K)}$

Exterior insulation and finishing system (EIFS) (operable)
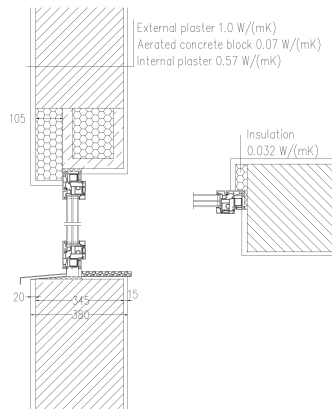
$U_{\text{Wall}} = 0.23\ \text{W/(m}^2\text{K)}$

Exterior plaster 1.0 W/(mK)
EPS 0.035 W/(mK)
Adhesive 0.70 W/(mK)
Sand−lime brick 1.0 W/(mK)
Interior plaster 0.57 W/(mK)

Suitable fastening, e.g. mounting frame or bracket, but only protruding as far as necessary for fixing the window

Ψ_{install}	W/(m K)
Top	−0.005
Left	−0.005
Right	−0.005
Bottom	0.022

$U_{W,\text{installed}} = 1.01\ \text{W/(m}^2\text{K)}$

Monolithic construction (operable)
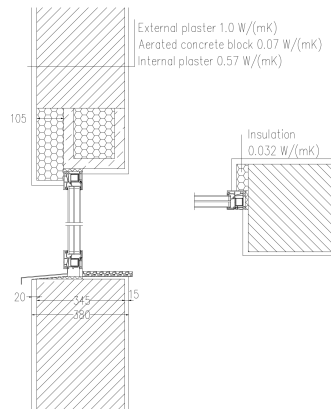
$U_{\text{Wall}} = 0.19\ \text{W/(m}^2\text{K)}$

External plaster 1.0 W/(mK)
Aerated concrete block 0.07 W/(mK)
Internal plaster 0.57 W/(mK)

Insulation 0.032 W/(mK)

Ψ_{install}	W/(m K)
Top	0.047
Left	0.004
Right	0.004
Bottom	0.029

$U_{W,\text{installed}} = 1.06\ \text{W/(m}^2\text{K)}$

Monolithic construction (fixed glazed)
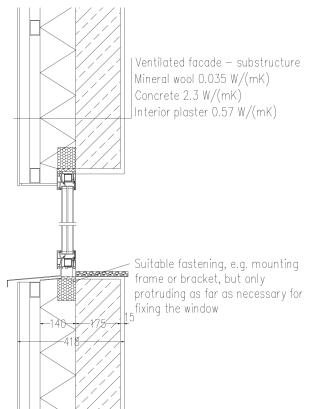
$U_{\text{Wall}} = 0.19\ \text{W/(m}^2\text{K)}$

External plaster 1.0 W/(mK)
Aerated concrete block 0.07 W/(mK)
Internal plaster 0.57 W/(mK)

Insulation 0.032 W/(mK)

Ψ_{install}	W/(m K)
Top	0.046
Left	0.009
Right	0.009
Bottom	0.029

$U_{W,\text{installed}} = 1.06\ \text{W/(m}^2\text{K)}$

Ventilated facade (fixed glazed)

$U_{\text{Wall}} = 0.23\ \text{W/(m}^2\text{K)}$

Ventilated facade − substructure
Mineral wool 0.035 W/(mK)
Concrete 2.3 W/(mK)
Interior plaster 0.57 W/(mK)

Suitable fastening, e.g. mounting frame or bracket, but only protruding as far as necessary for fixing the window

Ψ_{install}	W/(m K)
Top	−0.008
Left	−0.008
Right	−0.008
Bottom	0.022

$U_{W,\text{installed}} = 1.01\ \text{W/(m}^2\text{K)}$

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Ventilated facade (operable)

$U_{\text{Wall}} = 0.23\ \text{W/(m}^2\,\text{K)}$

Ventilated facade – substructure
Mineral wool 0.035 W/(mK)
Concrete 2.3 W/(mK)
Interior plaster 0.57 W/(mK)

Suitable fastening, e.g. mounting frame or bracket, but only protruding as far as necessary for fixing the window
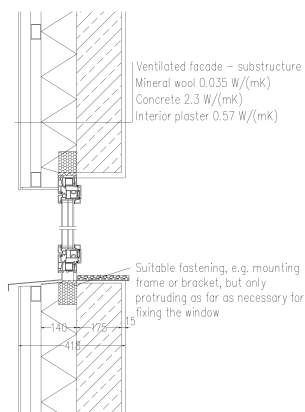
Ψ_{install}	W/(m K)
Top	−0.008
Left	−0.008
Right	−0.008
Bottom	0.022

$U_{W,\text{installed}} = 1.01\ \text{W/(m}^2\,\text{K)}$

Cavity wall (fixed glazing)
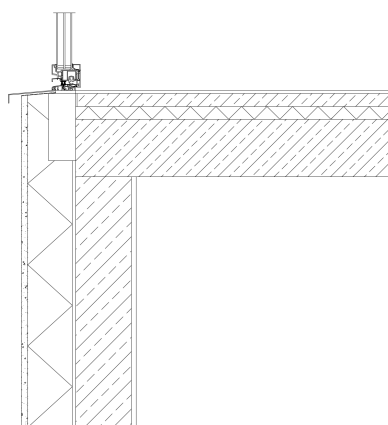
$U_{\text{Wall}} = 0.22\ \text{W/(m}^2\,\text{K)}$
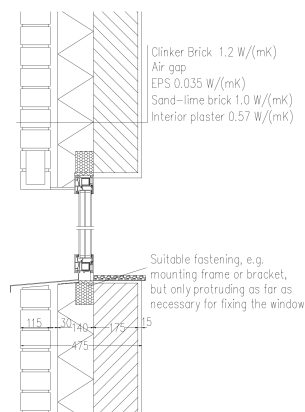
Clinker Brick 1.2 W/(mK)
Air gap
EPS 0.035 W/(mK)
Sand–lime brick 1.0 W/(mK)
Interior plaster 0.57 W/(mK)

Suitable fastening, e.g. mounting frame or bracket, but only protruding as far as necessary for fixing the window

Ψ_{install}	W/(m K)
Top	−0.006
Left	−0.006
Right	−0.006
Bottom	0.023

$U_{W,\text{installed}} = 1.01\ \text{W/(m}^2\,\text{K)}$

Exterior insulation and finishing s (EIFS) threshold (operable)

$U_1 = 0.23\quad [\text{W/(m}^2\,\text{K)}]$

$\Psi_{\text{install}} = 0.034\ \text{W/(m K)}$